Pyoderma Gangrenosum: A Systemic Review of the Incidence and Prevalence

Introduction: Pyoderma gangrenosum (PG) is a rare and serious skin disease in which a painful nodule breaks down to form a progressive enlarging ulcer and leads to a severe and significant increase in morbidity and mortality. The exact prevalence of Pyoderma gangrenosum has not been systematically reviewed and available except for the US and Europe. Reports published in various cited national and international journals claim the prevalence of Pyoderma gangrenosum to be 2-3 cases per 100,000 of population

Methods: The aim of the present study was to find out the incidence and prevalence of Pyoderma gangrenosum in countries outside the US and Europe. Eliminating the US and Europe, a planned prospective study with a standardised protocol for several different geographical locations was carried out. The search term used was "pyoderma gangrenosum". Cases from 1979 to 2014 were screened in databases such as PubMed, MEDLINE, and Science Direct, and scrutinisation of all the cases was carried out.

Results: Country-wise, data was obtained and analysed. A qualitative review of case reports and case series was carried out, and 2423 cases of PG were reported. Of those, 232 cases were identified as having classical PG, and 172 cases were of non-classical PG. Also, aggravating co-morbid factors resulting in PG were found; for example, in the case of Japan, PG was mostly associated with Takayasu's arteritis, and in Canada, PG is mostly seen in association with Crohn's disease and arthritis. Similarly, cases from the Middle East region, South Africa and Asia Pacific were also analysed, with Chile and Tunisia reported to have the highest number of classical PG cases.

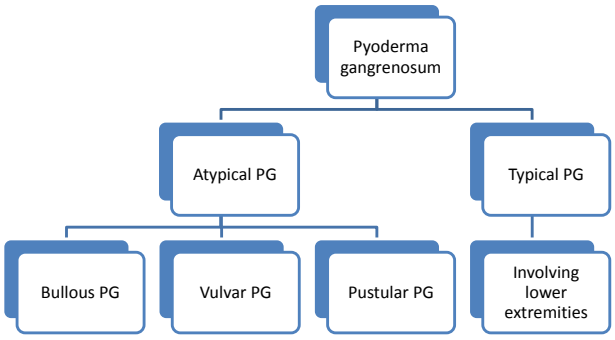
Limitation: - The limitation of the study was that number of hospitalised PG patients in the present year was not found; also 177 cases were not analysed as complete data for those was not available.

Conclusion: - A qualitative review of case reports and case series was carried out and 2423 cases of PG were reported. Of those, 232 cases were identified as having classical PG and 172 cases were of non-classical PG. From the study, the prevalence of PG was estimated and also co-morbid diseases associated with PG were known.

Introduction

Pyoderma gangrenosum is a rare and serious skin disease in which a painful nodule breaks down to form a progressive enlarging ulcer and leads to a severe and significant increase in morbidity and mortality of patients.[1] It is also known as serious rare non-infectious neutrophil dermatitis. Pyoderma gangrenosum is related to the systemic disease in approximately 50 % of patients. The aetiology and pathogenesis for PG are still poorly understood. The treatment of the disease is multifunctional and multidirectional depending on disease location and severity.

Pyoderma gangrenosum is classified broadly in two parts (Figure 1) such as Typical (classical PG, characterised by ulcers usually located on the lower proximities such as legs, and commonly associated with underlying IBD or rheumatoid arthritis) and Atypical Pyoderma gangrenosum (non-classical PG is characterised by ulceration on upper extremities such as mouth, face, abdomen, vulva, and is associated with other systemic diseases).[2]



Pyoderma gangrenosum treatment can involve a variety of health professionals as it is commonly associated with systemic conditions. The few associated systemic diseases are depicted in Figure 2.[3]

Figure 1: CLASSIFICATION OF PG

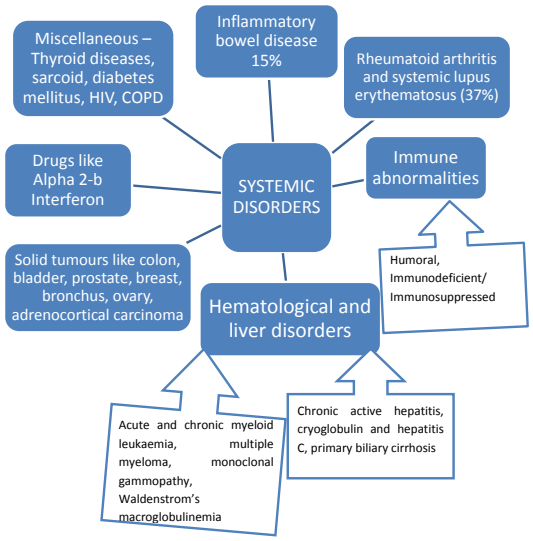


Figure 2: SYSTEMIC DISORDERS ASSOCIATED WITH PG

Collecting Data: Materials and Methods

A systemic literature search was carried out with the aim of finding the incidence and prevalence of Pyoderma gangrenosum worldwide. The regions included in the study were Asia Pacific, Middle East, Africa, and Latin America. The cases were classified as classical PG, non-classical PG and other types of PG (including PG with HIV, cancer, pregnancy, and PG in children).

Computerised databases such as PubMed, MEDLINE, and Science Direct were selected for literature review. The search term used was "Pyoderma gangrenosum", with PubMed showing 2346 articles and other databases showing 77 cases of PG. Thus the total number of cases available was 2423. The language of the search used was English.

Data Analysis

The data obtained was divided into two classes as: - (a) basic data and (b) advanced data.

Basic data includes year of publication, author, country, retrospectively or prospectively gathered data, number of patients in the particular study, age group, other co-morbid conditions like HIV, cancer, etc., and advanced data includes information of patients having classical PG (ulceration specifically involving leg) and patients having other type of PG (including bullous, vulvar PG, etc.).

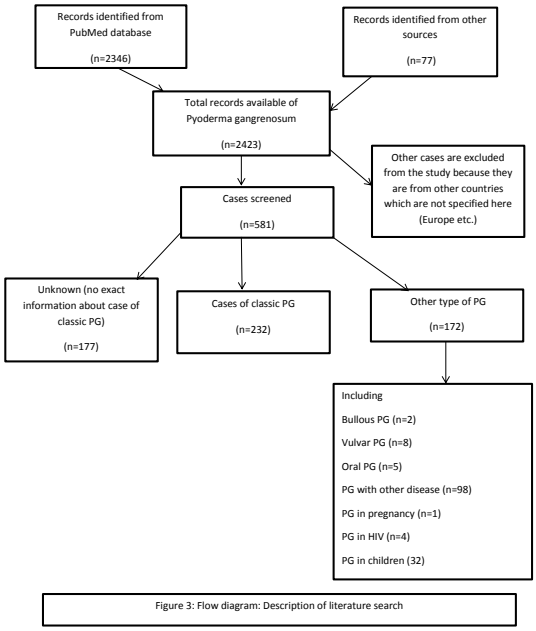


Figure 3: Flow diagram: Description of literature search

Analysis of Data Region-wise

Latin America

Countries like Brazil, Argentina, Chile, and Columbia were used in the study. Among these countries, a high prevalence of PG was found in Brazil and Chile.

For Brazil, PG along with UC, IBD, rheumatoid arthritis, myelodysplastic syndrome, adenocarcinoma, etc. were reported. Out of 48 cases, only eight cases were of classic PG and the other cases were PG with a combination of other diseases such as HIV, cancer, PG in pregnancy and childhood.

Mexico was reported to have 23 cases, out of which 14 were of classic PG and the others were of non-classic PG. Here, the association of PG was mainly observed with UC, IBD, and RA. Only limited cases were reported which showed the association of PG with diseases such as Takayasu's arteritis and caval thrombosis.[4]

Several case series were reported in Chile.[5] Out of 17 cases, 16 cases were of classic PG and most were associated with UC.

Africa

In Africa, a high number of cases were reported in Tunisia and West Africa.[6,7] Out of a total of 84 cases reported in Africa, 61 cases were of classic PG and the others were atypical/non-classic PG. Specifically, in Tunisia, 38 cases were reported and all were associated with UC or IBD. Additionally, for West Africa the case reports were available, involving 16 cases of PG associated with HIV (one case)[8], Takayasu's arteritis (one case)[9] and ulcerative colitis (14 cases).[10] Thus it can be concluded that PG in Africa is mostly associated with UC.

Middle East

In the Middle East region, the total number of cases reported was 49. Among them, 31 cases were of classic PG and the others were non-classic PG. In the Middle East region, Israel was reported to have the highest cases of classic PG. Also, PG in Israel is mainly associated with UC, CML, LAD, neutropenia, TB, scleroderma, occult colorectal malignancy, Behcet's disease, osteoporosis, systemic sclerosis, Takayasu's disease, etc.[11,12]

Asia Pacific [102-245]

The country-wise data of different countries of Asia Pacific was used to assess the epidemiology of Pyoderma gangrenosum. In Australia, a total of 88 cases of Pyoderma gangrenosum were reported. Out of them, 28 cases were of classic PG.[13] Cases such as PG at multiple sites[14], Pyoderma with secondary pyarthrosis were present[15]. Australia was among the major countries in which Pyoderma gangrenosum cases were highly reported.[16,17]

In Japan, 78 cases of PG were reported. Of those, 16 cases were of classic PG. Cases of Pyoderma gangrenosum such as PG with ulcerative colitis, tuberculosis[18], limb ischemia[19], Takayasu's arteritis[20], Behcet's disease[21], etc., were reported.

Figure 4 depicts the epidemiological data of available cases of Pyoderma gangrenosum in the several countries. Limitation: A limitation of this study is that the number of hospitalised patients of Pyoderma gangrenosum in the present year was not found out. Also, 177 cases of PG were not analysed as full data was not available. So,

there may be a probability of the presence of a few more cases of classical PG cases from these unknown cases.

Results: Country-wise data was scrutinised and different case reports and case series were analysed. Out of 2423 reported cases (from PubMed and other resources like Science Direct, a few online journals and the search engine, Google) of Pyoderma gangrenosum, 232 cases

Row Labels	Classic PG	Other Types of PG	PG type not known	Grand Total
Argentina	7	1	1	9
Australia	28	1	59	88
Bangladesh			1	1
Bhutan	1			1
Brazil	9	27	12	48
Cambodia			2	2
Canada	9	9	4	22
Chile	16		1	17
China	4	2	24	30
Colombia	9	1		10
Egypt	1	2		3
Fiji Islands		1		1
Hong Kong		2		2
India	19	37	7	63
Iran	2	3	2	7
Israel	21	4	1	26
Japan	16	31	31	78
Jordan		3		3
Korea		7	2	9
Lebanon	4	1	1	6
Malaysia			3	3
Mexico	14	5	4	23
Nepal		2	8	10
New Zealand	1	1		2
Nigeria	3	5	1	9
Pakistan		2	3	5
Philippines		1	1	2
Saudi Arabia	3	1	1	5
Singapore	1	1	1	3
South Africa	12	11		23
Sri Lanka		1	6	7
Taiwan	1	6		7
Tonga			1	1
Tunisia	37	1		38
Turkey		1		1
West Africa	14	2		16
Grand Total	**232**	**172**	**177**	**581**

were identified as having classical PG and 172 cases were identified having non-classical PG. Also the association of aggravating factors was found. Corresponding to Japan, PG is mostly associated with Takayasu's arteritis; in Canada, PG is associated with Crohn's disease and arthritis. Cases from the Middle East region, South Africa and Asia Pacific were analysed and among them Chile and Tunisia were reported with the highest cases of classical PG. Thus it can be predicted that development of PG is high in diseases such as ulcerative colitis, Crohn's disease, rheumatoid arthritis, Takayasu's arteritis (mainly in Japan), and Behcet's disease (for some cases).

Conclusion: A qualitative review of case reports and case series was carried out and 2423 cases of PG were reported. Of those, 232 cases were identified as having classical PG and 172 cases were of non-classical PG. From the prevalence data information related to types of PG, the total cases of PG and its associated co-morbid disease is known and from this data a systemic approach should be followed for the treatment of this rare disease. Thus further research and analysis in this study may throw a light on the prevalence and incidence of PG in these regions.

Abbreviations:

- PG: Pyoderma gangrenosum
- IBD: Inflammatory bowel disease
- UC: Ulcerative colitis
- CML: Chronic myeloid leukaemia
- RA: Rheumatoid arthritis

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